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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/688,417	10/17/2003	Khalil Najafi	UOM 0281 PUSP	2215
22045	7590	08/23/2005	EXAMINER	
BROOKS KUSHMAN P.C. 1000 TOWN CENTER TWENTY-SECOND FLOOR SOUTHFIELD, MI 48075			CHAMBLISS, ALONZO	
			ART UNIT	PAPER NUMBER
			2814	

DATE MAILED: 08/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/688,417

Applicant(s)

NAJAFI ET AL.

Examiner

Alonzo Chambliss

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 22 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 16-40 is/are allowed.
- 6) ☒ Claim(s) 1-12, 14 and 15 is/are rejected.
- 7) ☒ Claim(s) 13 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 October 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>10/17/03, 7/1/04</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Information Disclosure Statement***

1. The information disclosure statement (IDS) submitted on 10/17/03 and 7/1/04 was filed before the mailing date of the non-final rejection on 8/16/05. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

### ***Drawings***

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the " removing material from the second side of the substrate to thin the substrate before the step of forming the at least one hole ", " partially forming at least one hole in the first side of the substrate ", " thinning the substrate down ", " finish forming at least one hole completely through the substrate between the first and second sides after the step of thinning ", " removing material from the substrate to form at least one recess in the first side of the substrate before the step of bonding the wafer to the substrate ", " the step of thinning includes the step of etching the substrate at the second side of the substrate after the step of bonding the capsule to the device substrate", and " the step of thinning includes the step of removing material from the second side of the substrate to thin the substrate after the step of bonding the capsule to the device substrate and before the step of finish forming " must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 26. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of

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an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Specification***

4. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. The following title is suggested: " METHOD OF FABRICATING A MEMS DEVICE WITH VERTICAL FEEDTHROUGHS ".

### ***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1-12, 14, and 15 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Najafi et al. (US 6,338,284).

With respect to Claim 1, Najafi teaches providing a micromachined or MEMS device 612 fabricated on a first side of a substrate 600, and located within a vacuum or hermetic cavity. Forming at least one hole 902 completely through the substrate 600 between first and second sides of the substrate 600 after the step of providing. Forming a path of electrically conductive material 950, 960 connecting the micromachined or MEMS device 612 and the second side of the substrate through the at least one hole 902 to form the at least one substantially vertical feed through (see col. Figs. 9 and 10).

With respect to Claim 2, Najafi teaches wherein the substrate is a glass substrate (see col. 6 lines 18-23).

With respect to Claim 3, Najafi teaches wherein vacuum or hermetic cavity 212, 606 is at least partially defined by a capsule connected to the substrate at a bonding area (see Figs. 3 and 9).

With respect to Claims 4 and 5, Najafi teaches wherein the micromachined or MEMS device includes at least one metal microstructure. Oscillators, electrical filters, etc. inherently have metal microstructures (see col. 4 lines 40-50).

With respect to Claim 6, Najafi teaches forming a plurality of electrical leads 208, 614, or 970 on the first side of the substrate in communication with the micromachined or MEMS device (see col. 5 lines 45-51, col. 6 lines 36-52, and col. 7 lines 45-60; Figs. 3, 9, and 10).

With respect to Claim 7, Najafi teaches the step of providing may include the step of bonding a capsule to the substrate to form the vacuum or hermetic cavity and

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wherein the step of forming may include the step of partially forming the at least one hole from the first side before the step of bonding (see col. 7 lines 45-61).

With respect to Claim 8, Najafi teaches the step of forming the at least one hole includes the step of etching the substrate at the second side of the substrate (see col. 7 lines 23-32).

With respect to Claims 9, 10, and 12, Najafi teaches wherein the step of forming the path includes the step of depositing a layer of electrically conductive material (i.e. solder) on the second side of the substrate and in the at least one hole (see col. 7 lines 33-61; Fig. 10).

With respect to Claim 11, Najafi teaches bonding a wire to the layer of electrically conductive material from the sensor chip or MEMs device (see col. 7 lines 33-44).

With respect to Claim 14, Najafi teaches wherein the capsule is anodically bonded at the bonding area (see col. 6 lines 43-52 and col. 7 lines 22-32).

With respect to Claim 15, Najafi teaches wherein the capsule is eutectically or solder bonded at the bonding area (see col. 2 lines 23-35).

### ***Allowable Subject Matter***

7. Claims 16-40 are allowed.

The following is a statement of reasons for the indication of allowance subject matter: the prior art of record does not teach or suggest the combination of a wafer and substrate, wherein the first side of the substrate has a partially formed hole. Forming a MEMS device from the wafer after bonding the substrate to the wafer. Thinning the

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substrate down and forming at least one hole completely through the substrate between the first and second sides after the step of thinning along with the other limitations of claim 16.

8. Claim 13 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowance subject matter: the prior art of record does not teach or suggest the combination of removing material from the second side of the substrate to thin the substrate before the step of forming the at least one hole in claim 13.

The prior art made of record and not relied upon is cited primarily to show the product of the instant invention.

### **Conclusion**

9. Any inquiry concerning the communication or earlier communications from the examiner should be directed to Alonzo Chambliss whose telephone number is (571) 272-1927.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-7956

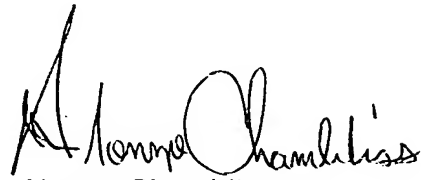
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system Status information for published



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AC/August 19, 2005



Alonzo Chambliss  
Primary Patent Examiner  
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